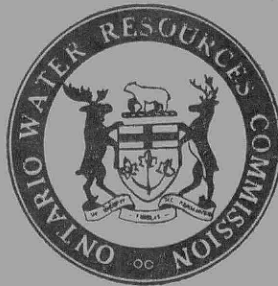
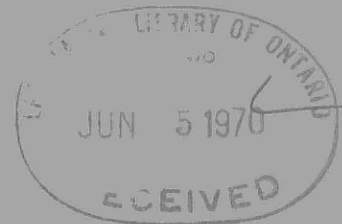


CA2 ON
WR 610
1969
C57



O.W.R.C.
Water Pollution
Survey

THE
ONTARIO WATER RESOURCES
COMMISSION



WATER POLLUTION SURVEY
of the
POLICE VILLAGE OF COTTAM
COUNTY OF ESSEX

1969

Copyright Provisions and Restrictions on Copying:

This Ontario Ministry of the Environment work is protected by Crown copyright (unless otherwise indicated), which is held by the Queen's Printer for Ontario. It may be reproduced for non-commercial purposes if credit is given and Crown copyright is acknowledged.

It may not be reproduced, in all or in part, for any commercial purpose except under a licence from the Queen's Printer for Ontario.

For information on reproducing Government of Ontario works, please contact ServiceOntario Publications at copyright@ontario.ca

CA20N
WR 610
1969
C57

REPORT
ON A
WATER POLLUTION SURVEY
OF THE
POLICE VILLAGE OF COTTAM
TOWNSHIP OF GOSFIELD NORTH
COUNTY OF ESSEX

1969

District Engineers Branch
Division of Sanitary Engineering

ONTARIO WATER RESOURCES COMMISSION

REPORT

INTRODUCTION:

A water pollution survey of water quality in surface water drains and storm sewers in the Police Village of Cottam was conducted in June 1969. Mr. W. E. Jackson, Clerk-Treasurer, Township of Gosfield North, supplied a map of the municipality and surrounding areas. Mr. M. Newman, Township Roads Superintendent, provided information as to the approximate locations of existing drains, directions of flow and locations of outlets.

Water pollution surveys are conducted on a routine basis by the Ontario Water Resources Commission for the purpose of locating, recording and evaluating sources of existing and potential pollution to watercourses. Enquiries and investigations are made with respect to drains which discharge to local watercourses and samples are collected to determine the significance of the drain discharges and their effects on the receiving waters. Where pollution sources are noted, recommendations are made regarding their abatement.

Where water pollution control works appear desirable, or expansions to existing facilities are necessary, the OWRC has a programme to aid in the construction and financing of these works. (See Appendix)

GENERAL:

The Police Village of Cottam, with an assessed population of 656 (1969 Municipal Directory) is situated in the Township of Gosfield North, County of Essex. The municipality is located along either side of Highway #3, approximately in the geographical centre of the county.

In general, most surface waters and other drainage from Cottam are directed, via open ditches, in a north-easterly direction to the Belle River, which flows to Lake St. Clair about 11 miles downstream.

The approximate location of village drains and outlying drainage ditches and directions of flow are indicated on the accompanying map. The sampling location points are also indicated.

Soil conditions in the municipality consist of a narrow ridge of Burford Loam-Shallow Phase along Highway #3 (Talbot Road) with outlying areas being Brookston Clay. Although the region along the ridge enjoys reasonably good natural drainage, the remainder of the municipality is almost level with poor drainage. Generally, the internal drainage of the soil is less than satisfactory, due to the clayey conditions, thus not being particularly suitable for the efficient functioning of septic tank field tile disposal units.

The Police Village of Cottam does not yet possess an Official Plan. However, it is understood that initial steps have been undertaken to prepare such a plan which certainly would prove invaluable for guiding the municipality's development in the event that more than limited growth is contemplated. A brief section headed "Community Planning" has been included in the appendix of this report.

WATER SUPPLY:

The Police Village of Cottam is served by the Union Water System.

WATER POLLUTION:

Sewage Treatment Facilities:

The Police Village of Cottam does not have communal sewage collection and treatment facilities. Individual septic tank systems are utilized for the disposal of sanitary wastes. In many cases, these systems do not operate effectively because of some clayey soil conditions in the area, which impair the functions of field tile disposal beds. Also, in parts of the municipality, particularly the more built-up areas, sufficient space is not available for the installation of adequate field tile disposal beds. Consequently, direct connections from private disposal units to surface water drains have illegally been made.

This has resulted in the discharging of inadequately treated sanitary sewage into the local surface water drainage system.

Industrial Wastes:

The municipality consists mainly of residential and commercial assessment with no major "wet" industries producing large volumes of waste water requiring treatment.

Refuse Disposal:

Refuse disposal in the municipality does not constitute a pollution hazard to local watercourses as it is trucked out under contract to an approved site.

Water Quality Analyses:

As a measure in locating and assessing the degree of pollution being discharged from Cottam, water samples were collected, where possible, from the flows of all known surface water and storm sewer outfalls. Representative samples were also collected from the receiving drainage ditches in the area and several catch basins in the municipality.

The sanitary chemical analyses and results of bacteriological examinations of samples collected are listed in Table 1. The locations of sampling points are designated on the accompanying map. Approximate locations and directions of flow of existing drains are also indicated on the map.

INTERPRETATION AND SIGNIFICANCE OF ANALYSES RESULTS:

For convenience in the interpretation of laboratory analyses results, the Ontario Water Resources Commission water quality objectives for surface water drains and watercourses are listed as follows:

Bacteriological Examination:

The membrane filter (MF) technique is employed at OWRC Laboratories to obtain a direct enumeration of coliform organisms and is reported per 100 millilitres (ml) of the sample.

The presence of coliforms may indicate pollution from both fecal and non-fecal sources while E.Coli organisms indicate pollution of intestinal origin only. The maximum limit of 2,400 coliform organisms per 100 millilitres is the objective for bacteriological quality of surface water in Ontario.

Sanitary Chemical Analyses:

Biochemical Oxygen Demand (BOD)

The BOD of sewage or polluted waters is the oxygen required during stabilization of the decomposable organic material by aerobic biochemical action. A five-day BOD determination with incubation at 20 degrees Centigrade is reported. A high BOD is indicative of organic or chemical pollution. A desirable upper

limit in surface water is four (4) parts per million (ppm) while the objective maximum in waste discharges to a watercourse is 15 ppm.

Solids:

The value for total solids, expressed in parts per million (ppm), is the sum of the values for the suspended and dissolved matter in water. The concentration of suspended solids which indicates the measure of undissolved solids of organic or inorganic nature is generally the most significant of the solids analyses in regard to surface water quality. The effects of suspended solids in water are reflected in difficulties associated with water purification, deposition in streams, and injury to the habitat of fish. The OWRC's objective for discharge is a suspended solids concentration of not greater than 15 ppm.

Alkyl Benzene Sulfonate (ABS)
(Anionic Surfactant) _ _ _ _

The surfactant is a synthetic organic chemical which is used as a principal ingredient of modern household detergents. The popular use of synthetic detergents for general cleaning purposes has resulted in the incidence of residual ABS in waste discharges. Therefore, the presence of detergents in water samples is usually an indication of pollution from domestic sources.

SIGNIFICANCE OF ANALYSES RESULTS:

By comparing the laboratory analyses results of samples collected during the survey with the objective water quality figures already presented in this report, the levels of pollution can be established. It is readily evident that extremely high levels of pollution were noted in all of the sampling locations examined. Sanitary chemical analyses and bacteriological examinations revealed BOD and suspended solids concentrations and coliform organism counts ranging to many times in excess of the maximum recommended levels. These excessively high values indicate the contamination to be caused by sanitary sewage. The high concentration of ABS in all samples collected substantiates the above conclusion.

This sanitary sewage may be gaining access to the surface water drainage system because of:

(1) Inadequacy of septic tank systems. This is particularly due to the soil conditions in some areas which do not lend themselves to the suitable operation of field tile disposal units. Also, it is probable that in some business and residential properties, sufficient space is not available for the installation of adequate field tile disposal beds.

(2) It is also probable that there is direct discharge of sanitary sewage and domestic waste through private drains into the local surface water drainage system. Laundry and kitchen sink wastes are probably being disposed of in this manner.

The lack of land area and generally unsatisfactory soil conditions for retention disposal has necessitated the discharge of overflow from the septic tanks and from the tile beds directly into the surface water drainage system. This septic material is a major source of pollution.

The discharge of polluting materials into a drainage system or watercourse constitutes a violation of regulations under the Ontario Water Resources Commission Act, Section 27, subsection 1.

SUMMARY AND CONCLUSION:

This is a report on a water pollution survey, carried out in the Police Village of Cottam, the purpose of which was to locate existing and potential sources of water pollution in the community. The survey was conducted in 1969 and the report is based on observations of field surveys and results of chemical analyses and bacteriological examinations of water samples collected at that time.

The survey revealed that sanitary sewage from the municipality is constituting a serious pollution problem both in and around Cottam and also in downstream areas. Sanitary wastes are gaining access to the municipal surface water drainage system which discharges via open ditches to the Belle River, which in turn flows to Lake St. Clair. The problem is due to generally adverse soil conditions in the area and some small lot sizes, which results in unsatisfactory septic tank systems and subsequent illegal connections to the local surface water drainage system.

Corrective action is required in order to alleviate the present conditions of pollution. Since the generally unsatisfactory soil conditions and some lot size limitations would probably not warrant corrective measures on an individual basis, possibly the best solution would be the construction of an adequate sewage collection and treatment system. It should be noted however, that the local watercourses have a somewhat limited assimilation capacity and that any works undertaken should concur with this limitation.

To ensure that any future development is properly planned and regulated and that satisfactory servicing is provided, it would be most beneficial to prepare and adopt an Official Plan.

In the interim, since the survey was conducted, the Ontario Water Resources Commission was pleased to receive a copy of a consultant's preliminary design report for a sewerage system for the Police Village of Cottam. We are glad to note that the municipality has taken the initiative in implementing a pollution abatement programme, and hope that in view of the existing pollution problem, the sewerage works project will proceed as quickly as possible.

RECOMMENDATION:

The pollution abatement programme leading to the construction of adequate sewage collection and treatment facilities for the Police Village of Cottam should proceed as quickly as possible.

Prepared by: *A. Burlachenko*.....
A. Burlachenko, Technologist
Division of Sanitary Engineering

TABLE 1
POLICE VILLAGE OF COTTAM
WATER POLLUTION SURVEY
JUNE 16, 1969

<u>Sampling Point No</u>	<u>Description of Sampling Points</u>	<u>BOD (ppm)</u>	<u>Solids (ppm)</u>			<u>Anionic Detergent as ABS (ppm)</u>	<u>Coliforms per 100 ml M. F</u>
			<u>Total</u>	<u>Susp</u>	<u>Diss</u>		
1.	Drain outfall appx. 300' east of school.	36	680	35	645	8	410,000,000
2.	Drain outfall appx. 300' east of school.	10	740	35	705	2	3,200,000
3.	Catch basin - south side of Belle River Road - appx. 200' east of Laird Street.	36	2,530	1,450	1,080	2	34,000
4.	Belle River Road drain - combined outfall near east limits of Cottam.	80	2,000	1,070	930	9	67,000,000

Table 1 (cont'd)

<u>Sampling Point No</u>	<u>Description of Sampling Points</u>	<u>BOD (ppm)</u>	<u>Solids (ppm)</u>			<u>Anionic Det. as ABS (ppm)</u>	<u>Coliforms per 100 ml M.F.</u>
			<u>Total</u>	<u>Susp</u>	<u>Diss</u>		
5.	Cottam sideroad drain out- fall at west limits of Cottam.	4.5	730	50	680	1	64,000
6.	Catch basin - at north east corner of Laird and Hill Streets.	90	860	70	790	21	110,000,000
7.	Catch basin - at east corner of Victoria and Fox Streets.	48	820	110	710	4	90,000,000
8.	Catch basin - at west side of Fox Street appx. 200' north of Victoria Street.	220	1,080	45	1,035	7	16,000,000

APPENDIX

IMPLEMENTATION OF WATER AND SEWAGE WORKS PROGRAMMES:

Currently, there are three general methods which may be utilized for implementing sewage and water works programmes. These are: 1) to enter into an agreement with the OWRC for the construction of the treatment and collector works with an obligation to pay the debt retirement and operating charges over the term of the agreement with the facility reverting to the municipality at the end of the term of the agreement, 2) by requesting the provision of service from a Provincially-owned project, and 3) by proceeding with the construction independently and meeting capital costs by the sale of debentures.

OWRC/MUNICIPAL PROJECTS

For the construction of water and sewage works under agreement with this Commission, the works are provided and developed under Sections 39 to 46 of the Ontario Water Resources Commission Act.

For this type of arrangement, the Commission utilizes a sinking fund and consequently the annual payments are based on a specific debt retirement period and the payments are unchanged for the period of the agreement. This type of project may be financed over a period of time up to a maximum of thirty years. The annual charges for projects constructed under this agreement are determined as follows:

1. Capital Repayment

As noted, OWRC financing is by the sinking fund method and an annual payment of approximately 2 per cent of the capital cost is required to retire a debt over a thirty-year period.

2. Interest

On new Commission projects, interest is calculated at the current rate.

3. Reserve Fund

To provide money for repairs and replacements, Section 40 of The Ontario Water Resources Commission Act provides for the

establishment of a reserve fund by the Commission. It is important to note that this fund is established in the name of the municipality and the balance consequently earns interest. It has now been established by Commission minutes that the reserve fund billing for each project shall continue only until the fund reaches an amount of ten times the initial annual billing and the reserve fund billing shall be re-imposed only when the fund has been depleted to 80 per cent or less of the maximum amount.

4. Operating Costs

Under OWRC agreement, the municipality is responsible only for the operating costs directly attributed to the project in the municipality. Therefore, no

charges are made by the Commission for the services of head office personnel who are available as required to advise on the satisfactory operation and maintenance of the project.

PROVINCIALY-OWNED WORKS

In June 1967, the Honourable J. R. Simonett, Minister of Energy and Resources Management, made an announcement which expanded the authorization of this Commission for the provision of water supply and sewage treatment facilities. This new programme allows the Commission to construct entire water and sewage works facilities for small municipalities. The capital costs of these can be amortized over a 40 year period.

A slight variation of this programme could be implemented in that the municipality may request that this Commission provide only the major water and sewage works facilities as Provincially-owned works, and develop the water distribution and sewage collector systems under the standard type of Commission project.

It would appear that, where applicable, it would be more advantageous for the municipality to proceed on the basis of requesting this Commission to develop entire systems as Provincially-owned works.

The associated cost of supplying these works, including amortization of capital costs, together with operating and maintenance charges, will be recovered by the sale of service to the affected municipalities by rates determined on a usage basis. These facilities will be wholly-owned by the Province of Ontario and the arrangements for service will be formalized by contracts between the Commission and the municipality concerned. The installations will be operated entirely at cost with appropriate provision for adjustment in rate.

COMMUNITY PLANNING

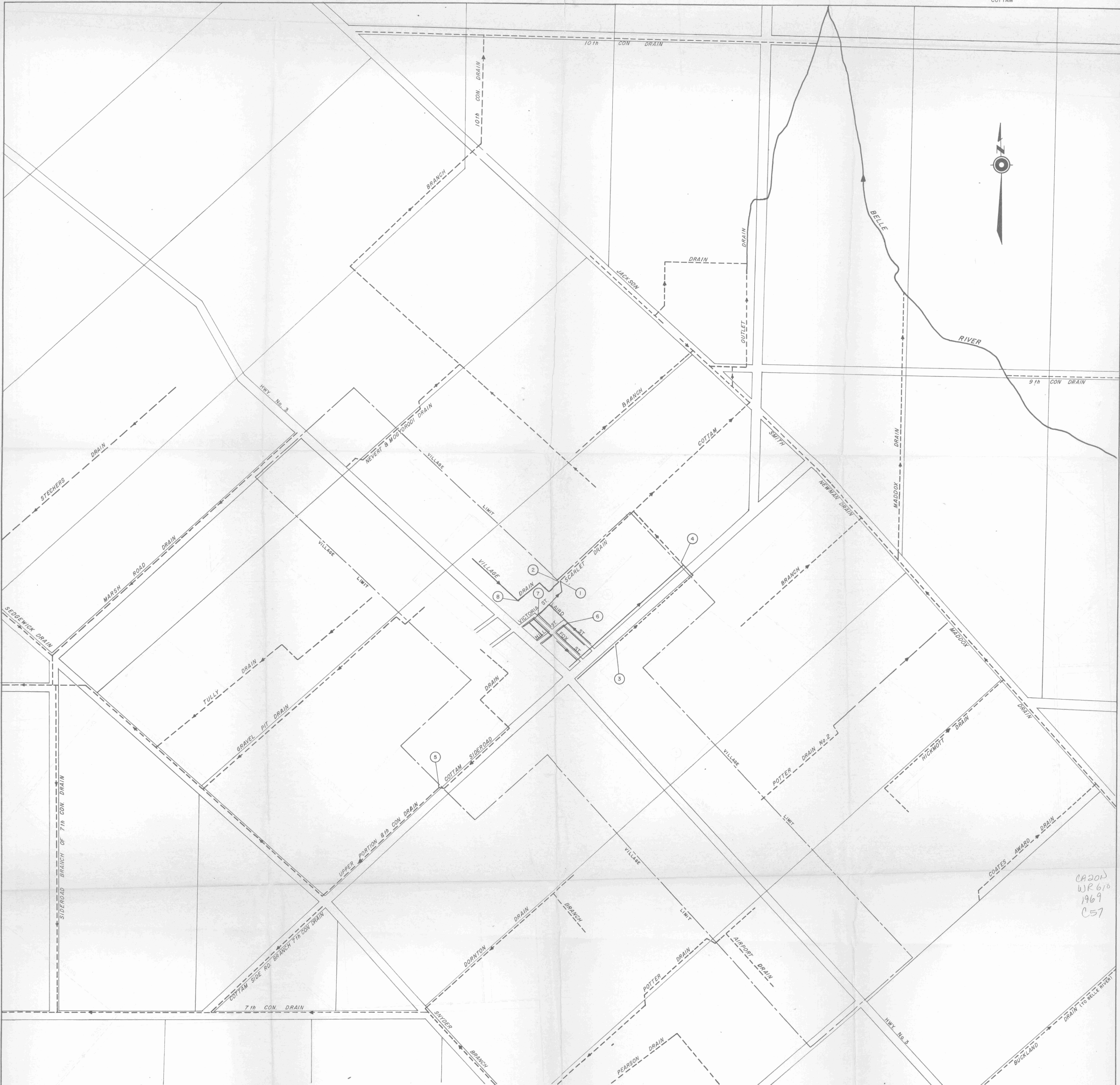
The need for effective planning has become more important today than ever before. Municipalities are being burdened with the rising costs of land and labour. Therefore, any project a community hopes to develop should be based on sound planning. Planning at all levels of government is essential but,

community planning can be most effective if interest and initiative is generated at the local level. The enormous benefits accrued as a result of good planning can more than compensate for the initial investment.

Community planning can be described as an effort to control and direct development effectively. This can best be achieved through the development of an Official Plan. An Official Plan is the stated intention of the local authorities with respect to orderly development within the planning area, that is prepared and set forth with professional assistance and meets the requirements as set out by the Provincial Planning Act. An Official Plan can be a joint effort by a number of municipalities which have common basic characteristics and common problems, or one municipality can establish a plan on its own initiative.

Orderly development yields future economy in services. Development in the community can be retarded where an Official Plan does not exist. A plan provides, among other things, the framework for the rational design of water and sewage works and also the extensions of mains and collector sewer systems.

A local council having decided to proceed with a programme of community planning definitely should contact the Ontario Department of Municipal Affairs. Through its many branches, information and guidance is provided to all interested parties.



CA20N
WR 610
1969
C57

- LEGEND**
- COVERED DRAINS
 - - - OPEN DRAINS
 - ③ — SAMPLING LOCATIONS

*Out
Environ
Water Dept*



ONTARIO WATER RESOURCES COMMISSION	
POLICE VILLAGE OF COTTAM TOWNSHIP OF GOSFIELD NORTH WATER POLLUTION SURVEY 1969	
SCALE: 660 0 660 1320 FT.	
DRAWN BY: L.L. BROOME	DATE: JULY, 1969
CHECKED BY: A.B.	DRAWING No: 69-95-DE



96936000009181